

Date: Thu, 21 Jan 93 02:10:41 PST
From: Info-Hams Mailing List and Newsgroup <info-hams@ucsd.edu>
Errors-To: Info-Hams-Errors@UCSD.Edu
Reply-To: Info-Hams@UCSD.Edu
Precedence: Bulk
Subject: Info-Hams Digest V93 #87
To: Info-Hams

Info-Hams Digest Thu, 21 Jan 93 Volume 93 : Issue 87

Today's Topics:

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 re. USCG CW changes
 Real hams?
 THE most accurate clock

Send Replies or notes for publication to: <Info-Hams@UCSD.Edu>
Send subscription requests to: <Info-Hams-REQUEST@UCSD.Edu>
Problems you can't solve otherwise to brian@ucsd.edu.

Archives of past issues of the Info-Hams Digest are available
(by FTP only) from UCSD.Edu in directory "mailarchives/info-hams".

We trust that readers are intelligent enough to realize that all text
herein consists of personal comments and does not represent the official
policies or positions of any party. Your mileage may vary. So there.

Date: 21 Jan 93 01:24:44 GMT
From: eram!dave@midway.uchicago.edu
Subject: 2m/70cm antenna
To: info-hams@ucsd.edu

In article <1993Jan18.032058.20986@sserve.cc.adfa.oz.au>,
pgc@csadfa.cs.adfa.oz.au (Phil Clark) writes:

| With the introduction of new conditions for the Novice licence in Australia,
| giving Novices access to the 70cm band, I have done a few experiments in using
| a J-Pole antenna on two bands.

A genuine J-pole, or a Slim Jim [tm] ? The latter is often called the former, to avoid petty trademark arguments. And how come the venerable Slim Jim (a folded J pole, or an end-fed folded dipole) is never mentioned in USA publications?

| Although theoretically it seems that it would not be possible to use one
| antenna on both bands, in practice one constructed for 2m can be used on
| 70cm by selecting a suitable compromise matching point on the transformer
| section.

Such a design appeared in "73" last year, called the "Copper Cactus." It was made from copper pipe, and apparently worked on 70cm (but not as well as one would hope).

| I hope to be able to publish these results (When I get time to write it up)
| in the journal of the Wireless Institute of Australia in the near future.

You'll want to mention prior art, of course :-)

Incidentally, I used a genuine Slim Jim on 2 and 70 (before I knew better, just after I was licenced). Seemed to work well.

--

Dave Horsfall (VK2KFU)
dave@esi.COM.AU

VK2KFU @ VK2RWI.NSW.AUS.OC
...munari!esi.COM.AU!dave

Date: Wed, 20 Jan 1993 20:38:49 GMT
From: dog.ee.lbl.gov!overload.lbl.gov!agate!spool.mu.edu!sdd.hp.com!
hpscit.sc.hp.com!hplextra!hpl-opus!hpnmdla!alanb@network.UCSD.EDU
Subject: Constructing a Gaussmeter
To: info-hams@ucsd.edu

In rec.radio.amateur.misc, KID%MILO@cutter.iarc.mco.EDU writes:

>I am planning on building a gaussmeter for measuring low-level
>electromagnetic fields. The plans are from the June 1990 issue of
>73 Amateur Radio in an article by J. Frank Brumbaugh KB4ZGC.

For measuring 60-Hz fields, I understand that a garden-variety bulk tape eraser works great. Just hook the line cord up to an oscilloscope or AC voltmeter. You can calibrate it by running a known AC current through a large single-turn coil. The field at the center of the loop is (to within about 10%):

$$H = 2 \text{ PI NI}/10r$$

where H is field strength in Gauss, N is number of turns, I is the current in amps and r is the radius in cm.

Example: a single-turn loop 11 inches in diameter (14 cm radius) gives 10 milligauss at its center with .223 A through it. You can get a more uniform field by using a Helmholtz coil, but the 1-turn loop is much simpler.

If you care about other than 60 Hz fields, you can flatten the frequency response with a 6 dB/octave de-emphasis network (low-pass R-C filter with pole well below 60 Hz). 47K and .1 uF would be minimum values.

I haven't tried this. This info comes from a letter by Lawrence Fleming of Innes Instrument Co, published in Electronic Engineering Times, Oct 15, 1990.

By the way, for those concerned about health effects of 60 Hz fields, gary@hpfcbig.SDE.HP.COM borrowed a field meter a couple years ago and measured fields from various devices in his home:

S300 15" color screen (2 feet away)	2 milligauss
Microwave oven (turned on, right at the door)	70 milligauss
Electric stove (turned on, right over burners)	45 milligauss
Small 13" TV, measured right at the screen	7 milligauss
Ambient level inside the house	around 1 milligauss
Directly under high-tension power lines	35 milligauss
100 feet from power lines	6 milligauss
150 feet from power lines	2 milligauss

For reference, the Earth's magnetic field is about 500 milligauss. I guess the fear is that 60 Hz fields are much more harmful than the "DC" earth field.

AL N1AL

Date: 20 Jan 93 08:16:51 GMT
From: psuvax1!uwm.edu!spool.mu.edu!agate!dog.ee.lbl.gov!network.ucsd.edu!news-mail-gateway@RUTGERS.EDU
Subject: Daily Solar Geophysical Data Broadcast for 19 January
To: info-hams@ucsd.edu

!!BEGIN!! (1.0) S.T.D. Solar Geophysical Data Broadcast for DAY 019, 01/19/93
10.7 FLUX=116.4 90-AVG=141 SSN=091 BKI=3323 3334 BAI=015
BGND-XRAY=B2.1 FLU1=1.1E+06 FLU10=1.0E+04 PKI=3323 3343 PAI=014

BOU-DEV=029,033,015,036,027,039,039,046 DEV-AVG=033 NT SWF=00:000
XRAY-MAX= B3.3 @ 0417UT XRAY-MIN= B1.9 @ 2233UT XRAY-AVG= B2.3
NEUTN-MAX= +004% @ 0205UT NEUTN-MIN= -003% @ 2050UT NEUTN-AVG= +0.1%
PCA-MAX= +0.1DB @ 2300UT PCA-MIN= -0.4DB @ 0900UT PCA-AVG= -0.0DB
BOUTF-MAX=55422NT @ 1025UT BOUTF-MIN=55378NT @ 1924UT BOUTF-AVG=55409NT
GOES7-MAX=P:+176NT@ 1904UT GOES7-MIN=E:-012NT@ 2053UT G7-AVG=+085,+021,+011
GOES6-MAX=P:+195NT@ 1902UT GOES6-MIN=E:-025NT@ 1859UT G6-AVG=+103,-001,+034
FLUXFCST=STD:110,105,105;SESC:110,105,105 BAI/PAI-FCST=015,015,010/018,015,010
KFCST=4333 3334 4333 3324 27DAY-AP=007,008 27DAY-KP=1123 3221 2333 2221
WARNINGS=
ALERTS=
!!END-DATA!!

Date: 21 Jan 93 08:14:17 GMT
From: news-mail-gateway@ucsd.edu
Subject: Daily Solar Geophysical Data Broadcast for 20 January
To: info-hams@ucsd.edu

!!BEGIN!! (1.0) S.T.D. Solar Geophysical Data Broadcast for DAY 020, 01/20/93
10.7 FLUX=110.0 90-AVG=141 SSN=065 BKI=3223 3310 BAI=009
BGND-XRAY=B1.7 FLU1=1.6E+05 FLU10=9.4E+03 PKI=3223 3322 PAI=010
BOU-DEV=034,010,017,027,025,031,005,004 DEV-AVG=019 NT SWF=00:000
XRAY-MAX= B9.8 @ 1314UT XRAY-MIN= B1.4 @ 2325UT XRAY-AVG= B2.1
NEUTN-MAX= +001% @ 2055UT NEUTN-MIN= -004% @ 1740UT NEUTN-AVG= -1.0%
PCA-MAX= +0.1DB @ 2025UT PCA-MIN= -0.3DB @ 0930UT PCA-AVG= -0.0DB
BOUTF-MAX=55417NT @ 1528UT BOUTF-MIN=55400NT @ 2000UT BOUTF-AVG=55410NT
GOES7-MAX=P:+098NT@ 2109UT GOES7-MIN=N:-008NT@ 0853UT G7-AVG=+069,+027,+007
GOES6-MAX=P:+123NT@ 1517UT GOES6-MIN=E:-008NT@ 2201UT G6-AVG=+088,+002,+038
FLUXFCST=STD:105,105,105;SESC:105,105,105 BAI/PAI-FCST=015,005,005/015,010,010
KFCST=3334 4333 1112 3111 27DAY-AP=008,006 27DAY-KP=2333 2221 0223 2231
WARNINGS=
ALERTS=
!!END-DATA!!

Date: Wed, 20 Jan 93 22:42:54 GMT
From: pacbell.com!charon.amdahl.com!netcomsv!bongo!skyld!janguis@network.UCSD.EDU
Subject: HTs at Disneyland
To: info-hams@ucsd.edu

In article <HIDEG.93Jan19185621@spsd630a.erim.org> hideg@spsd630a.erim.org writes:

> I went there about 3 years ago. The one time I tried to bring my HT in, the
> moron at the gate *yelled* at me that I cannot bring a radio into the park.

How did they know you had a radio? They're pretty damn hard to see in a fanny pack.

When did the "moron" start yelling? Immediately or after you gave him a bunch of shit about having an FCC license?

The whole secret to success with HT's in public places is not acting like a dork with the damn things. Of course, if you wish to appear as an Ambulance driver, that's your business.

netcom!bongo!jangus@skyld.tele.com "Als ik Kan", Gustav Stickley
US Mail: PO Box 4425 Carson, CA 90749-4425 1 (310) 324-6080

Date: 21 Jan 1993 01:01:26 GMT
From: pacbell.com!sgiblab!zaphod.mps.ohio-state.edu!cs.utexas.edu!bcm!lib!
oac.hsc.uth.tmc.edu!jmaynard@network.UCSD.EDU
Subject: HTs at Disneyland
To: info-hams@ucsd.edu

In article <727569774snx@skyld.tele.com> jangus@skyld.tele.com (Jeffrey D. Angus) writes:

> The whole secret to success with HT's in public places is not acting like
> a dork with the damn things. Of course, if you wish to appear as an Ambulance
> driver, that's your business.

Hey...if ya wanna insult us, at least call us EMTs...

(:-) as needed)

--

Jay Maynard, EMT-P, K5ZC, PP-ASEL | Never ascribe to malice that which can
jmaynard@oac.hsc.uth.tmc.edu | adequately be explained by stupidity.

"I don't want to read poor Microsoft bashing. I want to read good
Microsoft bashing." -- Douglas A. Bell, in comp.os.os2.advocacy (Me too!)

Date: Wed, 20 Jan 93 14:52:45 GMT
From: valinor.mythical.com!n5ial!jim@uunet.uu.net
Subject: HTs at Disneyland
To: info-hams@ucsd.edu

In article <HIDE93Jan19185621@spsd630a.erim.org> hideg@spsd630a.erim.org writes:

[regarding Disney World (In Florida)]

> I went there about 3 years ago. The one time I tried to bring my HT in,
> the moron at the gate *yelled* at me that I cannot bring a radio into
> the park.

the solution to this is fairly simple, *IF* you have one of the newer,
smaller HTs (e.g., my Kenwood TH-26AT), and not an older boat anchor
(e.g., my Kenwood TR-2400). basically, they're small enough to put in
your wife's purse, one of those fanny-pack things, a small backpack,
a camera bag, etc....

then, if questioned while using the HT inside, you just pull out the
copy of your license that you're required to have on you anyways, and
explain their error to them (politely).

--jim

--

#include <std_disclaimer.h>

73 DE N5IAL (/4)

INTERNET: jim@n5ial.mythical.com | grahj@valinor.mythical.com

j.graham@ieee.org (OLD): jim@n5ial.chi.il.us

AMATEUR RADIO: n5ial@w4zbb

AMTOR SELCAL: NIAL

ICBM: 30.23N 86.32W

Date: 20 Jan 1993 20:32:18 -0500

From: haven.umd.edu!news.umbc.edu!nobody@ames.arpa

Subject: KENWOOD TH-78

To: info-hams@ucsd.edu

In article <1993Jan15.224144.11609@cs.sfu.ca> ballanty@cs.sfu.ca (Rob Ballantyne)
writes:

> I'm just getting into radio and am looking for a first HT.

>

> I think that I want a dual band radio and I from the nice colour glossy
> sales sheets I seem to like the TH-78 the best. I've also looked at a
> IC-W2 but it seems to me that the 78 is the better radio. I've looked to
> see if I can find any opinions in the standard FAQ's but no one has offered
> any yet. So I ask explicitly: Please let me know your opinion of the TH-78.
> Should I be looking for a different radio for my first? Do you think there
> are any other models that I should consider?

>

Well, I have one, my girlfriend has one (I gave it to her for Christmas) and
I know at least five other people with them. It is a way cool rig.

One of the things that is pretty nice about it is that if you remove the diode

that opens up the receive range, it still doesn't let you transmit out of the HAM bands. This is great, IMHO, since I don't really want to accidentally throw my call out on some police repeater.

One problem I have had with both of the one's I've bought personally, is that it seems some of the radios are not tuned properly and appear to have PLL lock problems in the AM aircraft band. The symptom is that when the radio is tuned to some freq in the aircraft band, the radio beeps pseudo randomly. I'm guessing that this otherwise undesirable behavior is a PLL lock alert (although, there's nothing in the docs that specifcally suggest that). In both cases, I've had to go to the place of purchase and try new radios out of the box until I found one that appeared to work. What's totally inexplicable is that I recently got another one with the same problem. When I asked the owner of the establishment that sold it to me what he had heard from Kenwood about the problem, he said "nothing". So I asked what he had said to them about the problem, he said "nothing". So, thinking this was strange, I asked what he said was wrong with them when he returned them to Kenwood, and he said that he still had them in the back ! Wierd, since several months had passed since I found the first "broken" batch.

I've been a HAM for almost twenty years and tend to buy the latest technology of any type (I may have been one of the first ten people in baltimore with a handheld cell phone in 1985). The TH-78 does literally almost everything I would like it to do. It has two functionally independent receivers that can be set to scan independently of each other. It has an ingeneously small (although clearly low gain) antenna. It's just a great rig.

If I had my druthers, I would add a few features, such as priority lock out, where an incoming signal on one of the receivers would mute the audio from the other. I would probably make the "call" button programmable. They allow you to program the buttons on the speaker mike, programming the call button would be great. Let's face it, I **never** use it and it would be much more useful to have it as a DTSS button to take the radio out of DTSS mode once someone calls me. Maybe in the next ROM version.

My advice, is that it's the best rig going. The local HAM store is selling the things like hot-cakes. I would bet that they sell ten a week.

Brian

KA3BRZ

--

Brian Cuthie
Systemix Software, Inc.
brian@systemix.com

Date: Wed, 20 Jan 1993 20:02:05 GMT
From: saimiri.primate.wisc.edu!zaphod.mps.ohio-state.edu!howland.reston.ans.net!
spool.mu.edu!sdd.hp.com!hpscit.sc.hp.com!hplextra!hpl-opus!hpnmdla!alanb@ames.arpa
Subject: Need a 3rd hand for Soldering!?
To: info-hams@ucsd.edu

In rec.radio.amateur.misc, martin@datacomm.ucc.okstate.edu (Martin McCormick)
writes:

>... Electronics has always offered a mixed bag for
>blind experimenters. The tube-type stuff is easier to
>navigate by touch, but one always needed to beware of the
>voltages, inside. Also, one had to really use one's
>imagination to get around the problem of reading meters and
>other displays.
...
> If one needed to know whether a certain signal light was
>on, the fix was and is a light probe.

I wonder if, in the days of incandescent pilot lamps, if you couldn't
tell if it was on by the temperature. I know one of my blind friends
could tell if the table lamps in his home were on by the temperature --
from several feet away.

AL N1AL

Date: Thu, 21 Jan 1993 06:24:52 GMT
From: saimiri.primate.wisc.edu!sdd.hp.com!nigel.msen.com!fmsrl7!lynx.unm.edu!
umn.edu!csus.edu!netcom.com!jfh@ames.arpa
Subject: Northern California license classes?
To: info-hams@ucsd.edu

There is a weekend-long license class (for the no-code license) offered in
Sacramento on the last weekend of every month by a woman from Costa Mesa.
Has anyone out there taken the class? Is it any good? Are there any other
"do it at a sitting" classes around here? I've asked around, but not been
able to find any.

--

Jack Hamilton jfh@netcom.com P. O. Box 281107 SF, CA 94128-1107

Date: Thu, 21 Jan 1993 08:47:56 GMT
From: news.cerf.net!iat.holonet.net!bwilkins@network.UCSD.EDU
Subject: Radio Shack Business Band Radio
To: info-hams@ucsd.edu

rossi@gvlf9-q.gvl.unisys.com (Pete Rossi) writes:

:

: What exactly is required to get one of these licenses. Cost? Etc?
: Do you have to be a "real" business? Or could an individual get a
: license too?

The FCC years ago divided up the spectrum up into many small segments. The different user groups each got a slice. Each radio service has a set of rules that govern operation. Business is Business..Amateur is Amateur...Taxi is taxi ... An individual could licence in the personal radio service GMRS. Yes it is class A cb .. using repeaters in the 462 MHz uhf spectrum. 462.675 is monitored by many community watch groups. Watch for rs to be selling a portable in the GMRS 462MHz service soon.

--

Bob Wilkins n6fri voice 440.250+ 100pl san francisco bay area
bwilkins@holonet.net packet n6fri @ w6pw.#nocal.ca.usa.na

Date: Wed, 20 Jan 1993 22:04:41 GMT
From: decvrl!news.crl.dec.com!dbased.nuo.dec.com!nntpd.lkg.dec.com!
nntpd2.cxo.dec.com!10540.enet.dec.com!jepsen_st@decvrl.dec.com
Subject: re. USCG CW changes
To: info-hams@ucsd.edu

The concept that CW is of no value in amateur radio clearly comes from someone who doesn't use the mode. The idea that CW is dead in amateur bands comes from someone who doesn't listen to the CW segments of our HF bands or would like it to die for reasons of their own.

Whether the U.S.C.G. or anyone else uses the mode isn't relevant to amateur radio licensing requirements.

All the arguments for and against the mode aside. If it was a useless mode, no-one would use it. It is in wide use on the amateur bands and should be continued as a requirement for licensing on the HF bands.

If you don't want to take the time to learn CW then stay on VHF where it's not in common use.

Steve...AI7W

Date: Thu, 21 Jan 1993 05:22:03 GMT
From: haven.umd.edu!wam.umd.edu!adam@ames.arpa
Subject: Real hams?
To: info-hams@ucsd.edu

In article <9301192047.aa06911@ingate.microsoft.COM> a-kevinp@microsoft.COM (Kevin Purcell, Rho) writes:

>No-codes don't have the cranial capacity to understand what is
>required to become an extra.
>

>No doubt you're one of those no-codes who memorized the question
>pools using the Radio Shack handbook, and probably can't even
>pass the Novice exam again if you wanted to.

Whoever wrote this (I don't think it was Kevin Purcell), get a life.

Moron. Enough said. No code and glad to be a ham (and appreciated and respected much more than a few generals in my area),

N3NKI

Date: 21 Jan 93 09:56:49 GMT
From: news-mail-gateway@ucsd.edu
Subject: THE most accurate clock
To: info-hams@ucsd.edu

Willie Smith ,wpns@pictel.com
writes:

>Isn't there a signal broadcast around Germany (my brain says it's VHF,
>though I don't know why) that performs the same function as WWVB in
>the States? Lots of folks make clocks for that signal over there, and
>since it's a smaller country geographically you can actually receive
>the signal inside houses and stores without any external antennas.

You have only one letter wrong, the frequency is 77.5 kHz which actually is VLF. The transmitter is called DCF-77. One of the purposes of this signal is (at least it has been) for the German railroad to get an accurate clock for all railway stations. It is quite simple to make a good receiver for this signal, and a decoder consists of no more than a dozen standard CMOS chips if you only want to read the time. The transmitted signal contains year, month, date, weekday, hour and minute information. You have to count the seconds yourself from the provided second pulses. There is also a mark for the passage of second 0. The signal is locked to I think 8 or 10 cesium atomic clocks whose signals are weighed to provide the best accuracy possible. As you probably know the definition of one second is based on the resonance

behaviour of the cesium atom.

The transmitter is located somewhere in the south of Germany and the transmissions are heard in a large part of Europe. I think the range is about 2000km.

Peter, SM7LEK, <Peter@maxlab.lu.se>

Date: Thu, 21 Jan 1993 05:41:08 GMT
From: haven.umd.edu!wam.umd.edu!adam@ames.arpa
To: info-hams@ucsd.edu

References <1993Jan19.174420.25445@ms.uky.edu>, <C149D9.L1q@avalon.nwc.navy.mil>, <1993Jan20.20708.22965@ms.uky.edu>
Subject : Re: DJ580T DSM question

In article <1993Jan20.20708.22965@ms.uky.edu> miles@ms.uky.edu (Stephen D. Grant) writes:

>
> All you need to do is make a pre-arranged code. And share the code with
> those you would communicate with.
>

Well, I just wanna put my two cents worth in here. I bought a pager about a year ago. I used to have one for work, too, and where I worked, we all carried them over the summer. I hated the idea of someone calling me and a) not knowing who it was (we operate residence halls on campus over the summer and anyone could be calling from any front desk or anywhere) and b) not knowing if it was an urgent call or not (I had been interrupted for stupid things that could have waited while I was ...well, busy :-)

Anyway, I devised a system. Since I discovered you could put a space or a dash into the pagers, too (usually just digits showed up from our system's pagers)...well, the system was:

put in number you're calling from (either 5-digit extension or whole #)
followed by your pager number (last 2 digits) followed by the code if there was one:

911 EMERGENCY CALL NOW

411 INFO

(my friends and I had a few more, such as 38 for do you wanna go for Chinese, an inside joke, or 696969 for "Are you with a woman?"...another joke...)

So a complete call would look like this on my pager:

45275 00 911 -- My boss (pager #3800), call LaPlata Desk (a dorm), NOW.
45275 93 -- Me calling my supervisor from LaPlata Desk (routine call,
but we used our individual numbers to distinguish from just
a desk person calling us)

Another thing you could do is use last four or two or three digits of
phone numbers...that would work too (instead of pager IDs).

Good luck and I hope I helped. Drop me a line if you want me to explain
it better.

--Adam

Date: 20 Jan 1993 18:32:37 -0500
From: ncar!news.miami.edu!mthvax.cs.miami.edu!not-for-mail@ames.arpa
To: info-hams@ucsd.edu

References <930118151347_76703.3035_CHN93-1@CompuServe.COM>,
<C140I7.65L@panix.com>, <HIDE93Jan19185621@spsd630a.erim.org>1
Subject : Re: HTs at Disneyland

In <HIDE93Jan19185621@spsd630a.erim.org> hide9@spsd630a.erim.org (Steve Hideg)
writes:

>In article <C140I7.65L@panix.com> oppedahl@panix.com (Carl Oppedahl) writes:

>>Anybody have similar information on Disney World?
>>(In Florida)

>I went there about 3 years ago. The one time I tried to bring my HT in, the
>moron at the gate *yelled* at me that I cannot bring a radio into the park.

I wonder what he says to the Secret Service when they bring their radios
while their protectees visit the park???

--
bsherman@mthvax.cs.miami.edu | MCI MAIL:BSHERMAN
an764@cleveland.freenet.edu |

Date: 20 Jan 93 22:37:52 GMT
From: dog.ee.lbl.gov!overload.lbl.gov!agate!biosci!uwm.edu!spool.mu.edu!
sdd.hp.com!crash!telesoft!garym@network.UCSD.EDU

To: info-hams@ucsd.edu

References <1993Jan14.185149.9899@telesoft.com>,
<1993Jan14.235424.14613@telesoft.com>, <1993Jan15.193740.7974@telesof
Subject : STS-56 Element Set (082.30)

These are prelaunch elements for STS-56 based on a March 23 launch date.
This data is from Gil Carman at JSC via Lou McFadin. STS-56 will carry SAREX
(Shuttle Amateur Radio EXperiment), and this flight is a high inclination
orbit which will provide excellent coverage of most of the earth.

--GaryM

STS-56

1	00056U	93082.30325346	.00055200	00000-0	16200-3 0	28
2	00056	57.0020 168.1447 0011289	286.7156	73.2672	15.91759473	24

Satellite: STS-56

Catalog number: 00056

Epoch time: 93082.30325346 =====> (23 MAR 93 07:16:41.10 UTC)

Element set: JSC-002

Inclination: 57.0020 deg

RA of node: 168.1447 deg

Space Shuttle Flight STS-56

Eccentricity: .0011289

Prelaunch Keplerian Elements

Arg of perigee: 286.7156 deg

Launch: 23 MAR 93 05:50 UTC

Mean anomaly: 73.2672 deg

Mean motion: 15.91759473 rev/day

G. L. Carman

Decay rate: 5.52000e-04 rev/day*2

NASA Johnson Space Center

Epoch rev: 2

G.L.CARMAN

--

Gary Morris KK6YB

Internet: elements-request@telesoft.com

San Diego, CA, USA

Phone: +1 619-457-2700

End of Info-Hams Digest V93 #87
